SPECIAL ISSUE CONTAINING THE PRELIMINARY ANNOUNCEMENT OF THE SECOND NASHVILLE MEETING OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE AND ASSOCIATED SOCIETIES, DECEMBER 26–31, 1927.
EDITED BY BURTON E. LIVINGSTON, PERMANENT SECRETARY

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—*Contents*—

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SCIENCE

VOL. LXVI DECEMBER 2, 1927 No. 1718

CONTENTS

The American Association for the Advancement of Science:
Preliminary Announcement of the Second Nashville Meeting: DR. BURTON E. LIVINGSTON 517

Scientific Events:
The New Biology Buildings of the University of Birmingham; Darwin's Home for the Nation; Building Activities of the Chicago Zoological Society 534

Scientific Notes and News 536

University and Educational Notes 540

Discussion and Correspondence:
Tumors in the Lower Carboniferous: PROFESSOR ROY L. MOODIE. *Mastodon Remains in Washington:* DR. HAROLD E. CULVER. *Available Material in Comparative Anatomy and Pathology:* DR. HERBERT FOX. *Report of the Ransom Memorial Committee:* ELOISE B. CRAM 540

Scientific Apparatus and Laboratory Methods:
A Simple Device for Washing Culture Tubes: PROFESSOR I. M. LEWIS 542

Special Articles:
Notes on a Species Cross in Mice and on an Hypothesis concerning the Quantitative Potentiality of Genes: DR. C. C. LITTLE. *The Absorption Spectrum of Mercury at High Pressure admixed with Nitrogen:* DR. HOWARD R. MOORE 542

Science News x

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PRELIMINARY ANNOUNCEMENT OF THE SECOND NASHVILLE MEETING OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE AND ASSOCIATED SOCIETIES

THE ANNOUNCEMENT AND THE GENERAL PROGRAM

This special issue of SCIENCE is sent to all members of the American Association, whether they regularly receive this journal or *The Scientific Monthly*. It contains general and specific informa-

Those planning to attend the second Nashville meeting should arrange for lodging accommodations at once. The meeting is to open on Monday evening, December 26. A list of hotel and dormitory accommodations that will be available for this meeting, including information as to prices and showing the lodging headquarters for many of the sciences, appears in this issue of SCIENCE. See also the section on Organizations and that on Sessions of the Sections, in this issue.

All who are to present papers at Nashville, whether association members or not, should send their manuscripts to the permanent secretary's office (Smithsonian Institution Building, Washington, D. C.) as soon as possible. A second copy of each paper should be sent to *Science Service* (21st and B Sts., Washington, D. C.) and a third copy to the society or section secretary in whose program the paper is to be presented.

When purchasing the railway ticket to Nashville each purchaser should secure from the railway ticket agent a certificate for the meeting of the American Association for the Advancement of Science and Associated Societies. See the section on Railway Transportation, this issue of SCIENCE.

Life members of the association and annual members who have paid their dues for the current year should bring with them to Nashville their blue membership cards, which identify them as in good standing for the association year 1927–28.

tion about the second Nashville meeting. The complete general program of the meeting will be available at the registration offices at Nashville, in the Andrew Jackson Hotel, on Monday, December 26, and throughout the week. Registration will begin at 9 on Monday. Members of the association who do not attend the meeting may each secure a free copy of the general program promptly if they request it from the permanent secretary's office, Smithsonian Institution Building, Washington, D. C., provided that their dues for the association year 1927–28 have been paid. Requests should be received by December 22. If received later, they can not be given attention till after the close of the meeting.

THE VALUE OF THE ANNUAL MEETINGS OF THE ASSOCIATION

One of the chief ways by which the American Association aids the advancement of science consists in the holding of these annual meetings,[1] preparations for which now begin more than a year in advance in every case. They are large and complex, for they embrace nearly all of the broader fields of scientific study.

For the cultivation of some of the special sciences they are not in recent years so important as they once were, for each branch of science now has its own special American organization and many of these organizations now meet at other times or at other places. Some of them still meet regularly with the association, however, and others do so occasionally, especially at the larger four-yearly meetings, one of which occurs at the close of each leap year. The organization of the association is available as an aid to the societies that desire to hold meetings in the general convention of convocation week and the association undertakes to provide facilities for all these. With the aid of the local committees for each annual meeting it cares for the local needs of all the organizations that are to take part and the Washington office arranges reduced railway rates, manages the publication of the general program and directs the registration at the meeting.

Although most of the special scientific societies now find it necessary or desirable to meet separately or in small groups for the presentation of their contributions and for their legislative and executive proceedings, it is being increasingly appreciated that such means for the cultivation of the special sciences are not wholly adequate. Scientific research now generally involves much cooperative exchange between workers in distinct fields and workers in any one of the sciences must somehow be kept acquainted with what is being done in other sciences. Furthermore, it is also becoming increasingly clear that, for the welfare of all concerned, the knowledge and wisdom of workers in science must somehow be passed along to intelligent people in general, and just as rapidly as possible. With respect to these needs the annual meetings of the American Association and Associated Societies furnish means and opportunities that can not be supplied by the more specialized meetings. These great conventions promote and encourage the interchange of ideas among specialists in different lines of work and they supply one of the most valuable forms of contact between the devotees of science and the public. Such centrifugal diffusion of knowledge as is here implied is surely essential to the advance of the sciences and of science in general and to national and international welfare. From this point of view the complexity of our annual Christmas-week meetings, due to the fact that nearly all lines of serious study are represented in them, constitutes one of their greatest values. They bring together science workers from remote fields and they function as a sort of annual public exposition of what science is doing and trying to do. The news service at our meetings is specially important in the latter connection. The opportunities here provided for personal contact and the formation and renewal of acquaintance and friendship should not be undervalued. The joint sessions of several scientific groups, which are becoming more common at recent meetings, are also specially important, as are also the general sessions at which the broader aspects of scientific endeavor receive attention.

A MEETING IN THE SOUTH

The annual meetings of the association are distributed, in a period of years, over approximately the eastern half of the region in which most of its members reside. Four have been held in Canada, two in Minneapolis and one in Kansas City. There have been four meetings in the South, one at Charleston, South Carolina (in March, 1850, when the organization was two years old), one at Nashville (in August, 1877), one at New Orleans (in December, 1905) and one at Atlanta (in December, 1913). Most of the annual meetings have occurred in the region roughly represented by the triangle whose angles are Chicago, New York and Washington.

The meeting now announced is to be the second Nashville meeting and the fifth to occur in the South. It will be the eighty-fourth meeting of the association. While association membership is not so large in the Southern States as in other parts, yet our southern members are not behind the others in their

[1] See SCIENCE for November 25, page 493.

support of the advancement of science. It is hoped that many professional scientific workers and many friends of scientific progress and broad education, who may have been unable to attend the recent meetings of the association on account of their distance, will find it possible to be present at this Nashville meeting.

While it would not become a natural scientist in these days to attempt a long-time forecast of the weather conditions that are likely to prevail in convocation week at Nashville, yet it is safe to mention the great probability that Nashville weather at Christmas time will be pleasant and satisfactory for our meeting. More emphasis may be placed on the central location of this meeting place; it is nearly central in the region over which the annual meetings have been distributed.

A large attendance is assured, and the local committee has been so efficient in making the preliminary arrangements that there is no question that all who attend will be well cared for. As is shown by the following pages, the meeting promises to be very successful in every way.

The association and the societies that are to meet with it at Nashville will be the guests of Vanderbilt University, the George Peabody College for Teachers and the Ward-Belmont College for Women. The Nashville Chamber of Commerce is contributing in financial and other ways. Its convention secretary, Mr. W. N. Porter, is chairman of the local committee on hotels and housing. The Tennessee Academy of Science has played an important part in the preparations and the local committees have been aided by Scarritt College, the Southern Y. M. C. A. Graduate School and the Nashville Public Schools. We may be sure that Nashville hospitality will be unsurpassed.

LOCAL COMMITTEES AND LOCAL REPRESENTATIVES OF SECTIONS FOR THE SECOND NASHVILLE MEETING

General Chairman of Nashville Committees

W. S. Leathers, M.D., professor of preventive medicine and public health, Vanderbilt Medical School.

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A. E. Parkins, professor of geography, George Peabody College.

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J. M. Breckenridge, professor of chemistry, Vanderbilt University.

G. R. Mayfield, associate professor of German, Vanderbilt University.

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A. J. Didcoct, business manager, George Peabody College.

H. H. Shoulders, president of the Nashville Academy of Medicine.

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A. W. Wright, assistant professor of pathology, Vanderbilt Medical School.

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Each section of the association has, as usual, a local representative to look after the needs of the organizations that are related to the section. A list of the names of the local representatives is given below.

Representatives for Sections

Section A (Mathematics), C. M. Sarratt.
Section B (Physics), C. R. Fountain.
Section C (Chemistry), L. J. Bircher.
Section D (Astronomy), James McClure.
Section E (Geology and Geography), L. C. Glenn.
Section F (Zoological Sciences), E. E. Reinke.
Section G (Botanical Sciences), J. M. Shaver.
Section H (Anthropology), W. D. Weatherford.
Section I (Psychology), Joseph Peterson.
Section K (Social and Economic Sciences), C. B. Duncan.
Section L (Historical and Philological Sciences), H. C. Sanborn.
Section M (Engineering), W. H. Schuerman.
Section N (Medical Sciences), P. D. Lamson.
Section O (Agriculture), K. C. Davis.
Section Q (Education), S. J. Phelps.
For organizations not related to any particular section, C. P. Connell.

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Retiring Vice-President, Joseph H. Willits, University of Pennsylvania, Philadelphia, Pa.

(No secretary has been elected since the resignation of Doctor F. L. Hoffman last year, and no program for Section K has been arranged for the Nashville meeting.)

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Herman L. Fairchild (1927), University of Rochester, Rochester, N. Y.

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Joseph Erlanger (1928) (for Physiology), Washington University School of Medicine, St. Louis, Mo.

L. G. Hoxton (1929) (for Physics), University of Virginia, University, Va.

Vernon Kellogg (1929) (for Zoology), National Research Council, Washington, D. C.

W. Lash Miller (1930) (for Chemistry), 8 Hawthorne Ave., Toronto, Ont., Canada.

Oswald Veblen (1930) (for Mathematics), Princeton University, Princeton, N. J.

(The permanent secretary acts as secretary of the Committee on Grants.)

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Secretary, Rodney H. True, University of Pennsylvania, Philadelphia, Pa.

ASSOCIATED AND INVITED ORGANIZATIONS THAT ARE PLANNING SCIENTIFIC SESSIONS FOR THE NASHVILLE MEETING

THE following is a list of the organizations that have intimated their intention to take part in the annual meeting this year, together with the names and addresses of their respective secretaries and (as far as

* The number in parentheses denotes the year at the end of which the member's term of office is to expire.

* The number in parentheses denotes the year at the end of which the member's term of office is to expire.

possible) the names of their respective hotel headquarters for the meeting:

American Mathematical Society: R. G. D. Richardson, *Secretary;* Brown University, Providence, R. I.—*Hotel headquarters, Ward-Belmont College Dormitories.*

Mathematical Association of America: W. D. Cairns, *Secretary;* Oberlin College, Oberlin, Ohio.—*Hotel headquarters, Ward-Belmont College Dormitories.*

American Physical Society: Harold W. Webb, *Secretary;* Columbia University, New York, N. Y.—*Hotel headquarters, Ward-Belmont College Dormitories.*

American Meteorological Society: Charles F. Brooks, *Secretary;* Clark University, Worcester, Mass.—*Hotel headquarters, Hermitage Hotel, Union St. and Sixth Ave.*

Association of American Geographers: Charles C. Colby, *Secretary;* University of Chicago, Chicago, Ill.—*Hotel headquarters, Maxwell House, Church St. and Fourth Ave.*

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American Society of Parasitologists: W. W. Cort, *Secretary;* 615 N. Wolfe St., Baltimore, Md.—*Hotel headquarters, Hermitage Hotel, Union St. and Sixth Ave.*

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Botanical Society of America: A. J. Eames, *Secretary;* New York State College of Agriculture, Ithaca, N. Y.—*Hotel headquarters, Sam Davis Hotel, Commerce St. and Seventh Ave.*

American Phytopathological Society: R. J. Haskell, *Secretary;* Bureau of Plant Industry, Washington, D. C.—*Hotel headquarters, Sam Davis Hotel, Commerce St. and Seventh Ave.*

American Society of Plant Physiologists: Scott V. Eaton, *Secretary;* University of Chicago, Chicago, Ill.—*Hotel headquarters, Sam Davis Hotel, Commerce St. and Seventh Ave.*

American Society of Naturalists: L. J. Cole, *Secretary;* College of Agriculture, Madison, Wis.—*Hotel headquarters, Hermitage Hotel, Union St. and Sixth Ave.*

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Southern Society for Philosophy and Psychology: J. A. Highsmith, *Secretary;* College for Women, Greensboro, N. Carolina.—*Hotel headquarters, Tulane Hotel,* Church St. and Eighth Ave.

Metric Association: Howard Richards, *Secretary;* 156 Fifth Ave., New York, N. Y.—*Hotel headquarters, Ward-Belmont College Dormitories.*

Linguistic Society of America: Roland G. Kent, *Secretary;* University of Pennsylvania, Philadelphia, Pa.—*Hotel headquarters, Hermitage Hotel, Union St. and Sixth Ave.*

American Society for Horticultural Science: C. P. Close, *Secretary;* College Park, Md.—*Hotel headquarters, Tulane Hotel, Church St. and Eighth Ave.*

Potato Association of America: Walter M. Peacock, *Secretary;* Office of Horticultural Investigations, Washington, D. C.—*Hotel headquarters, Tulane Hotel, Church St. and Eighth Ave.*

American Nature-Study Society: E. Laurence Palmer, *Secretary;* State College of Agriculture, Ithaca, N. Y.—*Hotel headquarters, Tulane Hotel, Church St. and Eighth Ave.*

Society of the Sigma Xi: Edward Ellery, *Secretary;* Union College, Schenectady, N. Y.—*Hotel headquarters, Andrew Jackson Hotel, Deadrick St. and Sixth Ave.*

Tennessee Academy of Science: J. T. McGill, *Secretary;* Vanderbilt University, Nashville, Tenn.

NEWS SERVICE AT THE NASHVILLE MEETING

The object of the association news service is to inform the general public through the press regarding the work that is being done in American science as illustrated by the papers presented at the annual meetings. The news service is in charge of Austin H. Clark, of the U. S. National Museum, who was chairman of the publicity committees at the recent Washington and Philadelphia meetings. Mr. Clark is the manager of news for the American Association. The local committee on publicity, whose chairman is Professor G. R. Mayfield, has given very valuable help in this important phase of the preparations for the meeting. The association news service will again have the cooperation of Science Service, which will furnish news of the meeting to a series of dailies that have already arranged for this. It will be remembered that Science Service has offices in the National Academy Building, Washington, D. C., that it was organized to supply reliable science news to daily papers, that it is the publisher of the *Science News-Letter,* and

that the American Association is officially represented by three members on its board of directors. In addition, several other news organizations and a number of the great dailies will have representatives at the Nashville meeting.

The press representatives will be freely supplied with just as full and just as usable information as is possible, and much of it will be ready for use long before the date of release. This can be accomplished only in so far as those who are planning to give papers or deliver addresses at the meeting will send their manuscripts, accompanied by abstracts (preferably of about 500 words), or at least abstracts, to the news manager well in advance of the opening of the meeting.

The abstracts should be written in the simplest possible language, so that they may easily be understood by any one with a good education but with no knowledge of the details of the subject treated. Especially should the broader aspects of the work be indicated and the bearing which it has or may have on work in other lines. These manuscripts should each show the name of the organization before which the paper is to be presented, with information as to the date of presentation, as nearly as the latter can be given; at the top of the manuscript write, "Paper to be presented before the ———— (name) Society at its session on ———— (date)." Manuscripts for the news service should be sent to Mr. Clark, at the Washington office of the association, in the Smithsonian Institution Building. It needs to be emphasized that the efficiency of our news service will depend on the early sending of manuscripts by the authors; the material must be worked over and prepared for use by the representatives of the press and the greater part of this work must be done in Washington, before the meeting opens. The same applies to the working over of manuscripts by the staff of Science Service. *Prepare manuscripts in triplicate and send one copy to Mr. Clark, a second to Science Service and a third to the secretary of the society or section concerned.*

It is hoped that the material prepared by our news service may be made freely available to the press representatives, at least a week before the day of presentation of the paper in each case, marked for release only at the proper time. The daily press is now the strongest ally of the association, in its efforts to cultivate and extend an appreciation of science and research among intelligent people. The news service will try to bring authors of important papers into touch with the press representatives, for interviews, and the men and women of science who will be present at the Nashville meeting are asked to do all they can to facilitate the work of the newspaper men. Those who have news material are asked to cooperate with Mr. Clark, to the end that the news of the meeting may be consistently and efficiently released, and all press representatives and organizations are asked to cooperate in the same way.

THE NASHVILLE PRIZE

The fifth annual award of the American Association Prize, of one thousand dollars, will occur at the close of the Nashville meeting. A generous member of the association, who does not wish his name made known, has given the funds for the four prizes that have already been awarded and additional funds for five more prizes, including the one to be awarded this year. It is expected that the annual award will be continued indefinitely. The prize is awarded each year to the author of a notable contribution* to science presented at the annual meeting. All papers presented in any of the programs of the Nashville meeting are to be eligible for consideration by the Committee on Award; it is not necessary that the author be a member of the association. There is to be no open competition and no submitting of papers for the prize. The rules and procedure by which the award is to be made have been published in SCIENCE for November 25. The award will be announced at the close of the meeting, through the news office.

TRANSPORTATION TO AND FROM NASHVILLE

Reduced railway rates, by the certificate plan, have been granted for this meeting by the railway passenger associations of the United States and Eastern Canada, whose courtesy and public spirit will be greatly appreciated. The round-trip fare for a person attending the meeting is to be one and one half times the regular one-way fare.

Tickets to Nashville are to be purchased within time limits as follows: December 22 to 28, inclusive, for the following lines: Canadian Eastern lines, New England lines, Trunk lines, Central lines and Southeastern lines. For the Western and Transcontinental lines the limits are December 16 to 22, inclusive, from Arizona, British Columbia, California, Idaho, Nevada, Oregon and Washington; December 20 to 26, inclusive, from Utah; December 21 to 27, inclusive, from Colorado (except Julesburg), Montana, New Mexico and Wyoming; December 22 to 28, inclusive, from Colorado (Julesburg only), Illinois, Iowa, Kansas, Mani-

* It may sometimes be the *most* notable contribution presented, but there is obviously no way by which important contributions in different scientific fields may be satisfactorily compared as to their several degrees of goodness. The wording in the text is strictly accurate and official and such superlatives as "best" and "most noteworthy" are not to be applied under any circumstances.—B. E. L.

toba (on the Great Northern, the Northern Pacific and the Milwaukee, St. Paul and Sault Ste. Marie railways, also from Winnipeg *via* the Canadian National and Canadian Pacific railways), Minnesota, Missouri, Nebraska, Northern Michigan, North Dakota, South Dakota and Wisconsin. For the Southwestern lines the limits are December 21 to 27, inclusive, from Oklahoma and Texas; December 22 to 28, inclusive, from Kansas, Missouri, Arkansas and Louisiana. The following Southwestern lines do not offer the reduced excursion fares: (1) Arkansas & Louisiana-Missouri Ry., (2) Fort Smith & Western R. R., (3) Graysonia, Nashville & Ashdown R. R., (4) Kansas, Oklahoma & Gulf Ry., (5) Louisiana and Arkansas Ry., (6) Mississippi River and Bonne Terre Ry. and (7) National Railways of Mexico.

Persons residing in the regions of reduced rates (almost all the United States and Canada, see above) should each purchase a first-class, full-fare, one-way, through ticket to Nashville, and be sure to secure a certificate on the "Standard Certificate Form," reading for the Nashville meeting of the "American Association for the Advancement of Science and Associated Societies"; a receipt is not required.

Persons residing outside the regions of reduced rates should each purchase a round-trip ticket to the nearest station issuing through tickets to Nashville and lying within the region of reduced rates. On arrival at that station each person should purchase a one-way ticket to Nashville and secure a certificate, as directed in the preceding paragraph.

Upon arrival at the meeting, each person should register immediately, at the registration offices in the Andrew Jackson Hotel. Be sure to fill in all blanks on the registration card and leave the card at the registration desk, where you will receive a numbered identification card, which will be receipted for the registration fee if you pay it. (See Registration, below.) Then leave your railway certificate at the validation desk, being sure that the identification card (which you keep) is there marked to show that you have deposited a certificate. Your certificate will subsequently be endorsed by the association and then validated by the agent of the transportation companies. Call for it later at the validation desk, presenting your identification card.

Unvalidated certificates will not be honored for the purchase of return tickets, and unendorsed certificates can not be validated. Registration is, therefore, necessary in order to have a railway certificate validated. Each person registering is entitled to the validation of his own certificate.

For the return trip, railway ticket agents at Nashville will honor any properly endorsed and validated certificate if presented at least 30 minutes before the scheduled time of departure of the train for which it is to be used. To each person presenting an endorsed and validated certificate they will sell a continuous passage, one-way, return ticket for one half of the regular fare, by the same route as that followed on the trip to Nashville. The last date on which certificates may be validated is December 31. The last date on which return tickets may be purchased is January 4.

TRANSPORTATION IN NASHVILLE

For this meeting the distances are short between the hotel region and the meeting places and between the Union Depot and either the hotel district or the meeting places. The hotel district is about two miles from the university and college buildings, in which the scientific sessions are to be held, and the Union Depot (Louisville and Nashville R. R. and Nashville, Chattanooga and St. Louis Ry.) is between the hotel district and the campuses, about six or eight city blocks from the hotels. From the Union Depot one takes street cars on Broadway, west bound (marked "Hillsboro") for the campuses and east bound for the hotels. There are buses as well as street cars. To reach the Union Depot or the campuses from the hotels, take cars marked "Hillsboro," which may be boarded at Fourth Avenue and Church Street (for those lodging in Maxwell House), at Sixth Avenue and Church Street (for those lodging in Andrew Jackson Hotel or Hermitage Hotel), at Seventh Avenue and Church Street (for those lodging in Sam Davis Hotel, Y. M. C. A. or Y. W. C. A.), or at Eighth Avenue and Church Street (for those lodging in Tulane Hotel). The dormitory buildings are only a few minutes' walk from any of the session rooms.

Special transportation between the hotels and the campuses is being planned for the meeting. Further information and charts of the college grounds and the hotel district are to be included in the General Program.

LODGING ACCOMMODATIONS

The lodging accommodations for those who attend the second Nashville meeting are to be mainly in the hotels and dormitories named in the accompanying table. Special symbols in the table have these meanings: TB, two single beds; DB, double bed; TDB, two double beds (to accommodate four persons); an asterisk denotes that rooms without bath are provided with running water. The general headquarters is to be the Andrew Jackson Hotel, on the lower floor of which will be located the registration and news offices and the science exhibition. Headquarters for those in the several fields of science are to be as follows:

Andrew Jackson Hotel (general headquarters): Engineering, Medical Sciences, Education.

Hermitage Hotel: Zoology, Entomology, Microscopy, Genetics, Parasitology, Ornithology, Meteorology, Linguistic Science, History.

Maxwell House: Geology, Geography. (See, also, Peabody Dormitories, below.)

Tulane Hotel: Horticulture, Nature Study, Anthropology, Psychology, Philosophy.

Sam Davis Hotel: Chemistry, Botany, Phytopathology, Ecology.

Ward-Belmont College for Women, Dormitories: Mathematics, Physics, Astronomy.

George Peabody College for Teachers, Dormitories: Geography Teaching.

tions in these institutions. Their prices, as well as those of smaller hotels in the central district and a number of uptown apartment hotels, which will be available if needed, are to be from $1.25 to $3 per day per person. In case of need additional rooms will be available in fraternity and sorority houses and other dormitories connected with the colleges, at $2 per day per person. There will be no insufficiency of lodging accommodations, but early reservations are highly desirable, to avoid possible disappointment as to location and price. Every one planning to attend the Nashville meeting should make reservation now.

LODGING ACCOMMODATIONS AT NASHVILLE

Hotel or Dormitory	Location	Number of Rooms	Telephone No.	Prices, per day Without Bath 1 person	Without Bath 2 persons	With Bath 1 person	With Bath 2 persons
Andrew Jackson	Deadrick St. and 6th Ave.	400	6–6101	.....	.....	$2.50–$5	$4.00–$6 DB $5.00–$7 TB
Hermitage	Union St. and 6th Ave.	250	6–2161	.....	.....	$2.50–$5	$4.00–$7 TB
Sam Davis	Commerce St. and 7th Ave.	250	.....	.....	.....	$2.50	$4.00 DB $5.00 TB
Tulane	Church St. and 8th Ave.	200	6–1601	$1.50	$3.00 TB $2.50 DB	$2.00 $3.00	$4.00 DB $5.00 TB
Maxwell	Church St. and 4th Ave.	200	6–1131	$1.50	$2.50 TB $3.00 TB	$2.00 $3.00	$3.50–$4 DB $5.00 TDB
Savoy	7th Ave., near Church St.	75	6–2681	$1.50	$2.50 DB $3.00 TB	$2.00 $3.00	$3.50–$4 DB $5.00 TB
Ward-Belmont Dormitories	Belmont Heights	500	7–3100	$2 per day per person (Some with twin beds, some single.)			
Peabody Dormitories	21st Ave.	300	7–3600	$2 per day per person (Some with twin beds, some single.)			

The hotels are about two miles from the meeting places on the college and university campuses. The meeting places are close together and only a few minutes' walk from the Ward-Belmont and Peabody dormitories. Transportation is by regular street cars and buses, but special transportation for the meeting is being planned, which will make the trip between hotels and campuses in about fifteen minutes or less.

Hotel reservations should be made by writing directly to the hotel concerned, statement being made as to kind of accommodations desired, date of arrival and approximate price. Those who desire the lower-priced rooms should send in their requests early. Many reservations have already been made. For rooms in dormitories, which are close to the meeting places, requests for reservations should be addressed to the Ward-Belmont College or the Peabody College. The Nashville Y. M. C. A., Y. W. C. A., Y. M. H. A. and Y. W. H. A. are in the hotel district of the city and are to be addressed directly by those desiring reserva-

REGISTRATION AT THE NASHVILLE MEETING

The Registration Offices for the meeting will be in the main lobby of the Andrew Jackson Hotel, Sixth Ave. and Deadrick St. They are to be in charge of Mr. Sam Woodley, executive assistant of the American Association, and will be open from 9 to 6 daily, throughout the period of the meeting. Registration is necessary in order to secure the official identification card, the official badge, the general program, etc., and in order that railway certificates may be endorsed and validated. All who attend any of the sessions should register as promptly as possible, whether they are members of the association or not.

A Registration Fee of one dollar is to be paid by each person registering for this meeting, excepting such visitors from the outside of the United States as may be personally invited to be the guests of the association. The moneys thus collected will go into the

fund for the meeting and will help defray some of the costs. But, if you are a paid-up member of the American Association for the Advancement of Science or if you are an associate for this meeting, the registration fee may be remitted to you; that is, you may register without paying the fee. *Paid-up members should bring with them to Nashville their blue membership cards for 1927–28.* Registrants who are not paid-up members of the association or associates may place themselves in the privileged category by paying their dues before registering. Personally invited guests are not to pay the fee. Instructions regarding procedure for those not paying the registration fee will appear on the reverse of the registration card. The card is to be filled out whether the fee is to be paid or not.

Registration will be Accomplished as Follows: Fill in the blanks on a registration card, which will be furnished in the registration room, and present the card at the cashier's desk, paying the registration fee if required. The registration card will be stamped to show whether the fee is paid or not. Then present the registration card to the registration clerk, who will keep it and will give you a numbered official identification card, together with the badge for the meeting, a copy of the General Program, etc. The identification card will be specially stamped if the registration fee has been paid and your name will be placed immediately in the visible directory of those in attendance. After registration you should leave your railway certificate at the validation desk, where your identification card will be marked to show that a certificate has been left. (See above, under Transportation to and from Nashville.)

Delegates from institutions and organizations, and all personally invited guests, are specially requested to register as such, noting on their registration cards their exact status in this particular.

Visitors from outside of the United States and Canada who are not members of the association may be invited to the meeting as guests of the association. Members of the association should make recommendations as to visitors who should receive official invitations, giving reasons. Such recommendations should be in the permanent secretary's office in Washington by December 20 at latest.

SPECIAL PRIVILEGE FOR MEMBERS OF AFFILIATED SOCIETIES

New members of the association regularly pay an entrance fee of five dollars, which is now remitted, however, to members of any affiliated organization, including the affiliated state academies. Those who join at the Nashville meeting and take advantage of this privilege should fill in the blanks on a blue membership application card and present card and dues for 1927–28 ($5.00) at the membership-dues desk in the registration offices in the Andrew Jackson Hotel. New members who join the association at the meeting are entitled to register without paying the one-dollar registration fee.

Copies of a booklet on "The Organization and Work of the American Association," as well as membership application cards and sample copies of the journals, may be secured at any time from the permanent secretary's Washington office in the Smithsonian Institution Building. Membership in the association includes a subscription to the weekly journal SCIENCE, or *The Scientific Monthly,* for the calendar year beginning at the close of the annual meeting. The journal alone is worth more than the annual membership dues. By special arrangement with the publishers, members in good standing may have both SCIENCE and *The Scientific Monthly* by paying $3.00 in addition to the annual dues ($8.00 in all). Members of the association may also subscribe for *The Science News-Letter,* published by Science Service, Washington, D. C., at the specially reduced price of $3.00 per year.

INFORMATION SERVICE, MAIL, EXPRESS, TELEGRAMS, ETC., AT THE NASHVILLE MEETING

Those in attendance at the meeting may obtain information of all sorts by applying at the Information desk in the registration offices, in the Andrew Jackson Hotel. Attention is called, however, to the visible directory of those in attendance, from which information regarding attendance and the addresses of attending members of the association and societies may be obtained without application at the desk.

Persons attending the meeting may have mail, etc., addressed to them in care of the American Association for the Advancement of Science, Registration Offices, Andrew Jackson Hotel, Nashville, Tenn. They should inspect the personal bulletin every day, which will be conveniently located. If a person's name appears on this bulletin, he should inquire at the proper desk for mail, etc. Uncalled for telegrams will be sent to hotels or dormitories each afternoon when the registration offices close.

BUSINESS SESSIONS OF THE ASSOCIATION AT NASHVILLE

The members of the executive committee of the association council, the secretaries of the association sections and the secretaries of the scientific societies that meet with the association this year will dine together on Friday, December 30, at 6:30 at the Andrew Jackson Hotel. The dinner will be complimentary from the American Association. The evening will

be devoted to the annual secretaries' conference on the affairs of the association and its relation to the associated organizations.

The executive committee will hold its first Nashville session in the permanent secretary's room at the Andrew Jackson Hotel, on Monday, December 26, at 10 o'clock. Matters for consideration on Monday by the committee or by the council should be transmitted to the Washington office, to arrive by December 20. Other sessions of the executive committee will be held at 10 o'clock on Tuesday, Wednesday, Thursday and Friday mornings, in Room 101, Industrial Arts Building, George Peabody College for Teachers.

The council of the association will meet in the Andrew Jackson Hotel on Monday afternoon, December 26, at 2 o'clock. Other sessions are scheduled to occur at 9 o'clock on Tuesday, Wednesday, Thursday and Friday mornings, in the council room, Room 101, Industrial Arts Building, George Peabody College for Teachers. It is probable that the annual election of officers of the association will occur at the council session Thursday morning. Business to be considered by the council must regularly be first brought before the executive committee through the permanent secretary. Communications for the permanent secretary should be addressed to the Washington office (to arrive by December 20) or to the Andrew Jackson Hotel (to arrive December 26). During the meeting they may be handed in to Mr. Woodley in the registration offices, at the same hotel.

Immediately following the council session on Monday afternoon, an academy conference will be held by the association's special committee on academy relations. This committee consists of the representatives of the affiliated state academies (one from each affiliated academy), together with all members of the committee on interacademy relations that was appointed by the academy conference at Philadelphia, and three members representing the executive committee of the association. The members of the special committee will dine together following the conference, at the association's complimentary academy dinner, at 6:30, at the Andrew Jackson Hotel. The dinner will be over in time for the opening session of the Nashville meeting. A special session of the Tennessee Academy of Science is announced for Monday morning at 10, to welcome visiting members of other state academies.

THE SCIENCE EXHIBITION

The annual exhibition of scientific apparatus, materials, methods, books, etc., will be in the Andrew Jackson Hotel, adjacent to the registration offices. Nearly all the available space has been engaged by the exhibiting firms, but some attractive exhibits of a purely scientific nature will be included. The exhibition has become a very important part of the annual meeting. Its popularity steadily increases from year to year, both with the exhibiting firms and with those who attend the meeting. It furnishes a ready means by which those who purchase laboratory apparatus and supplies and scientific books may examine the products of the best makers and publishers. It also makes it possible for research workers to become acquainted with new models of apparatus, new methods and new publications in their own and other fields. The exhibition has become a sort of social center, also, a place where friends and acquaintances may meet and spend many agreeable and profitable periods during the week of the meeting. Such exhibitions are very effective in promoting the personal exchange of ideas, not only among scientists in the same field but between workers in widely different sciences.

As in recent years, the Nashville exhibition will be in charge of Major H. S. Kimberly, exhibition manager. It is under the general direction of the exhibition committee, of which H. E. Howe, editor of the *Journal of Industrial and Engineering Chemistry*, is chairman. Major Kimberly has had valuable help from the local committee on exhibition, of which Dr. J. M. Breckenridge, professor of chemistry in Vanderbilt University, is chairman.

GENERAL SESSIONS OF THE ASSOCIATION

The second Nashville meeting will be held under the presidency of Dr. A. A. Noyes, eminent chemical investigator and leader in chemical education, professor of chemistry and director of the Gates Chemical Laboratory of the California Institute of Technology.

The general sessions at the annual meetings of the association are planned to be of interest to all workers in science and to educated people generally. They are the only sessions held by the association as a whole. The following notes give information about the general sessions that are planned for the Nashville meeting, as far as statements can be made at the time this preliminary announcement goes to press. Times of occurrence may require alteration.

The opening session will occur on the evening of Monday, December 26, in the auditorium of the Nashville War Memorial Building, at 8 o'clock. The main speaker of the evening is to be Dr. L. H. Bailey, well-known student of systematic botany, author and editor of our most valuable reference books on cultivated plants and many books on nature and rural life. Dr. Bailey was president of the association

last year. He is to deliver at Nashville the address of the retiring president, on "The Biologies."

Following the opening session will occur the general reception to those who attend this meeting, by the local committees and other local representatives. Refreshments will be served. The reception is to be in the Andrew Jackson Hotel, Deadrick St. and Sixth Ave.

On Tuesday evening, December 27, in the auditorium of the War Memorial Building, the sixth annual Sigma Xi lecture will be given. This lecture is provided by the Society of the Sigma Xi and regularly occurs on the second evening of the annual meeting of the association. The lecturer this year is Dr. Clarence Cook Little, president of the University of Michigan, eminent student of genetics, especially in relation to susceptibility to cancer. He will speak on "Opportunities for research in mammalian genetics."

Wednesday, December 28, will be characterized by two general sessions bearing on the diffusion of scientific knowledge, "Science for the People." A morning and an afternoon program are being arranged by Austin H. Clark, of the U. S. National Museum, science-news manager of the association.

Wednesday afternoon at 4:30 is to be given the fifth annual Josiah Willard Gibbs Lecture, under the joint auspices of the American Mathematical Society and the American Association. This lecture is arranged by the American Mathematical Society. The lecturer this year is Professor Ernest W. Brown, of Yale University, eminent mathematician and astronomer. Dr. Brown's subject is "Resonance in the solar system."

The retiring vice-presidential address for Section D (Astronomy) is to be given at the general session on Wednesday evening, by Dr. Robert G. Aitken, of the Lick Observatory, Mount Hamilton, California, well known for his researches on binary stars and in other fields of astronomy. He will speak on the life and work of Edward Emerson Barnard. That noted astronomer was born in Nashville in 1857, and was graduated from Vanderbilt University in 1886. He made many valuable contributions to astronomy, among which may be mentioned the discovery of the fifth satellite of Jupiter. It is specially fitting that a general session at this Nashville meeting should be devoted to his memory.

A general session on the afternoon of Thursday, December 29, is to be devoted to a series of papers by well-known investigators, on some phases of the economic relations of science workers. This program has been developed by the Committee on the Economic Status of College and University Workers, a subcommittee of the association's Committee of One Hundred on Scientific Research, of which Dr. Rodney H. True, of the department of botany of the University of Pennsylvania, is secretary. The opening address is to be by Dr. A. A. Noyes, president of the American Association. Mr. Harrison E. Howe, editor of *Industrial and Engineering Chemistry,* will speak on "The relation of research to wealth increase." "Comparative salary scales of trained men" is the subject of a paper to be presented by Dr. Rodney H. True, secretary of the Committee of One Hundred. Professor Jessica B. Peixotto, of the department of social science, University of California, author of "Getting and spending at the standard of professional living," will discuss "Family budgets of university faculty members." Discussions of these papers will follow by well-known scientists. This session should prove to be of great interest to all who attend the Nashville meeting.

Another general session, on "Aquiculture," is being planned for Thursday afternoon, at 2:30. A program of invited papers is being arranged by Professor Robert E. Coker, of the University of North Carolina, for the Committee on Aquiculture, a committee organized at the request of the National Research Council. The committee invites the counsel and cooperation of those interested in hydrobiological research or in the practical development of aquiculture. It is hoped that botanists, zoologists, geologists, chemists, meteorologists, engineers, economists and others may cooperate to promote the utilization of water areas for the culture of fishes, water birds, crustacea, pearl mussels, fur-bearing mammals, aquatic and swamp plants, etc. Some of the most fundamental problems of biology are involved in this project.

The general session Thursday evening is to be devoted to a lecture on "Science and the Newspapers," by Dr. William E. Ritter, well-known research worker and leader in zoology and writer on philosophical aspects of biology. Dr. Ritter was the organizer and for many years the director of the Scripps Institution of Oceanographic Research, at La Jolla, California. He has been a leader in the organization and guidance of the popular Science Service, of Washington, D. C., which was endowed by the late E. W. Scripps for the purpose of supplying science news to the daily press. This general session will continue and round out the Wednesday symposium on "Science for the People." The following note on his address has been received from Dr. Ritter:

Science and journalism are both very powerful influences in modern civilization, but they have developed independently in large measure and they are sometimes more or less antagonistic. A study of the work of such men as Benjamin Franklin and Thomas Jefferson, who combined scientific research with ardent support of the

newspapers and who mightily influenced our material development, leads to the thought that closer cooperation is needed between the scientists and the journalists.

NON-TECHNICAL LECTURES AT NASHVILLE

Recognizing that the truths of science, the scientific method of thought and the principles and standards of scientific scholarship need to be presented at every opportunity to the general public and especially to adolescents, the American Association generally provides a number of non-technical lectures and demonstrations at the annual meetings. A series of such lectures is being arranged for the people of Nashville, some of them especially for students in the schools. These will be announced later. Speakers will be provided for several luncheon-meetings of local organizations.

A TRIP TO THE GREAT SMOKY MOUNTAINS

Those who attend the Nashville meeting are invited to visit the Great Smoky Mountains after the close of the meeting. Those who take advantage of this invitation will be provided with transportation and entertainment for the trip from Knoxville to the mountains and return, as guests of the Chamber of Commerce of Knoxville, Tenn. A national park is being established in the Great Smokies, which are exceptionally rich and varied in both flora and fauna. Many peaks rise to elevations of over 6,000 feet above sea level and the region presents many interesting geological features, stratigraphic, structural and physiographic.

This invitation to visit the Great Smoky Mountains is from the Tennessee Academy of Science, the University of Tennessee, Vanderbilt University, the Great Smoky Mountains Conservation Association, the Smoky Mountains Hiking Club and the Knoxville Chamber of Commerce. Correspondence concerning the trip may be addressed to Professor L. R. Hesler, Botany Department, University of Tennessee, Knoxville, Tenn. During the meeting information in this connection may be had in the registration offices, in the Andrew Jackson Hotel.

SESSIONS OF THE SECTIONS AND SOCIETIES

Nearly all branches of science will be well represented in the many scientific sessions of the sections and associated societies at Nashville. Preliminary notes on the programs that are being arranged for these sessions are given below. The information has been contributed by the section and society secretaries, for whose cooperation in the preparation of this section of our announcements the permanent secretary is deeply grateful. Full information about the scientific sessions will be given in the General Program of the meeting, which will be available Monday morning, December 26, at the registration offices, in the Andrew Jackson Hotel, at Nashville. A copy of the book will be mailed free to any member in good standing whose request for it is received before December 22 at the Washington office of the association.

The following accounts are arranged under headings that correspond to the sections of the American Association.

A. Mathematics.—The American Mathematical Society and the Mathematical Association of America will meet jointly with Section A of the American Association for the Advancement of Science on Thursday afternoon, December 29. Professor E. V. Huntington, of Harvard University, retiring vice-president for Section A, will deliver his address on "The notion of probable error in elementary statistics." Of the two other addresses one will be by Professor Dunham Jackson, retiring president of the Mathematical Association of America, on "The human significance of mathematics;" in the second Professor Arnold Dresden, of Swarthmore College, representing the American Mathematical Society, will speak on "Some philosophic aspects of mathematics." The fifth Josiah Willard Gibbs Lecture, under the auspices of the American Mathematical Society and the American Association for the Advancement of Science, is to be delivered at a general session Wednesday afternoon, December 28, by Professor E. W. Brown, of Yale University, the title of his lecture being "Resonance in the Solar System." The American Mathematical Society will hold sessions for the presentation of papers, Wednesday morning and afternoon and Thursday morning, December 28–29. On Wednesday morning Professor James Pierpont, of Yale University, will deliver an address on "Mathematical Rigor, Past and Present." The Mathematical Association of America will hold morning and afternoon sessions on Friday; addresses will be given by Professors Archibald Henderson, A. R. Crathorne, Jewell Hughes, J. A. Harris and E. P. Lane, and by Vice-principal W. Betz. An informal dinner will be held on the evening of December 29 at the mathematical headquarters, Ward-Belmont College for Women, where the mathematical sessions are also to be held.

B. Physics.—Section B of the American Association will meet jointly with the American Physical Society and with the American Meteorological Society. The meetings will occupy Wednesday, Thursday and Friday, December 28 to 30. Wednesday afternoon will be given the retiring vice-presidential address for Section B, by Professor William Duane, of Harvard University, and an address by Dr. C. J. Davisson, of the Bell Telephone Laboratories. Pro-

fessor Duane's title is "The General Radiation." Dr. Davisson has been invited to speak on "Diffraction of Electrons by a Crystal of Nickel," a subject of great significance in the new quantum dynamics. His address will be followed by a discussion. This Christmas meeting of the American Physical Society is also its annual meeting, at which (in alternate years) the address of its president is given. The subject chosen this year by the president of the society, Professor K. T. Compton, of Princeton University, is "Recent Studies of the Electric Discharge." The address will probably be given Thursday. The regular program of the American Physical Society, for the reading of ten-minute papers, will constitute several sessions. Headquarters for physicists will be the Ward-Belmont Dormitories. The American Meteorological Society will hold sessions on Thursday and Friday. The society will join with the Association of American Geographers and Section E in a symposium on "The Mississippi River, its Problems and its Control," in which the U. S. Weather Bureau will be represented by several speakers. A session will be devoted to the Tennessee Weather Service, with a luncheon or informal dinner, to bring together as many as possible of the original observers and prominent meteorologists whom Tennessee has produced. In the general program, the winds of the United States, climatological observations for students in the field, and many other subjects will be discussed. The meteorological headquarters will be The Hermitage Hotel, Union St. and Sixth Ave.

C. Chemistry.—The program of Section C includes several half-day sessions, mainly on Tuesday and Wednesday, December 27 and 28, to avoid as far as possible conflict with the Symposium in Organic Chemistry to be held in Columbus, Ohio, later in the week. Professor Lauder W. Jones, the retiring vice-president for the section, will speak on "A Glimpse at Chemistry here and abroad." He has spent much of the last two years in Europe and this address will be very valuable. Among others who will address Section C may be mentioned at this time Professor W. A. Noyes, of the University of Illinois, Professor Harry B. Weiser, of Rice Institute, and Professor James Kendall, of New York University. Professor Noyes will speak on "Valence." Professor Weiser has chosen as the title of his address "Ionic Antagonisms in Colloid Systems." Professor Kendall will give a paper entitled "Separations by the Ionic Migration Method." In addition to the above there will be a number of shorter papers. Section C will meet with Section N on Wednesday forenoon, for a joint session on "Contributions of Other Sciences to Medicine." Headquarters for chemists will be the Sam Davis Hotel, Commerce St. and Seventh Ave.

D. Astronomy.—The American Astronomical Society is not meeting with the association this year and the Nashville program on astronomy will therefore be wholly in the hands of section D. The sessions will occur early in the week, to permit those in attendance to get to New Haven for the meetings of the Astronomical Society there. Nashville was the birthplace and home through youth to manhood of the eminent astronomer Edward Emerson Barnard. The address of the retiring vice-president for the section, Professor R. G. Aitken, of the Lick Observatory, will take cognizance of this by reviewing the life and contributions of that illustrious man of science. It will be given in the general session Wednesday evening. The Josiah Willard Gibbs Lecture, of the American Mathematical Society, to be given this year by Professor E. W. Brown, of Yale University, on "Resonance in the Solar System," will interest workers in astronomy. It will occur at the general session Wednesday afternoon. Headquarters for astronomers will be the dormitories of the Ward-Belmont College for Women.

E. Geology and Geography.—Section E will meet at Nashville Tuesday and Wednesday, December 27 and 28, under the chairmanship of Professor Charles Schuchert, of Yale University, in conjunction with the Association of American Geographers and the National Council of Geography Teachers. The address of the retiring vice-president for the section, Dr. George H. Ashley, geologist of the Commonwealth of Pennsylvania, will be on "Geology and the World at Large." Section E is arranging a symposium to be held Tuesday, on the "Geology of the Gulf States," to include reviews by state geologists and correlations by specialists. The Association of American Geographers will hold several sessions at Nashville, but information concerning the programs is not at hand. The National Council of Geography Teachers will meet Tuesday and Wednesday, with special emphasis given to the subject of "teacher training." The headquarters of the council will be in West Dormitory, George Peabody College for Teachers.

F. Zoological Sciences.—Section F will present no program of its own at Nashville, since several of the associated societies are to be meeting there. The retiring vice-presidential address for the section will be given by Dr. Winterton C. Curtis, of the University of Missouri, at a dinner for all zoologists, Thursday evening, December 29. His title is "Old Problems and New Technique." The American Society of Zoologists will hold its twenty-fourth annual meeting on Wednesday, Thursday and Friday. Many contributions are to be presented by demonstration or exhibit in the laboratory rather than by formal reading. A biologists' smoker is being arranged.

The Entomological Society of America will hold morning and afternoon sessions on Tuesday and Wednesday, under the presidency of Dr. F. E. Lutz, of the American Museum of Natural History. A symposium on "The Physiology of Insects" will be held on Tuesday afternoon. The annual public address of the society will be delivered by Dr. H. T. Fernald, of the Massachusetts Agricultural College. There will be exhibits of specimens and equipment. The American Association of Economic Entomologists will hold its fortieth annual meeting from December 27 to 31. The Section of Plant Quarantine and Inspection will meet on Tuesday. Late on Tuesday afternoon and Wednesday morning there will be papers and discussions on apiculture. The regular sessions of the Association of Entomologists will open on Wednesday afternoon. The main address will be that of the president, Professor R. W. Harned, head of the Mississippi Plant Board and of the department of entomology at the A. and M. College of Mississippi. The entomologists' dinner will be held on Wednesday evening. The papers to be read deal with artificial and natural control of insect pests generally. There will be a joint session of the Association of Entomologists with its Cotton States Branch. The extension entomologists and members of the Insect-Pest Survey will meet Thursday evening. Reading of papers will be continued on Friday and the meeting will close on Saturday with a final business session. The American Society of Parasitologists will hold its third annual meeting from December 27 to 30. A special program on the teaching of parasitology has been arranged, with papers and discussions. A series of invited papers will be given on medical problems in parasitology, including the control of malaria and hookworm disease. The address of the retiring president, Dr. R. P. Strong, will be of special interest, for he has just returned from an extended African trip. The Wilson Ornithological Club will hold its annual meeting on Friday and Saturday when morning and afternoon sessions will be devoted to reading of papers by members of the Wilson Club and of the Tennessee Ornithological Society, an affiliated organization. The official business session will be held on Saturday morning, the ornithologists' dinner on Saturday evening, and a special field excursion is planned for Sunday, for those who can take part. The Hermitage Hotel, Union St. and Sixth Ave., is to be headquarters for all these zoological groups.

G. Botanical Sciences.—On Wednesday afternoon, December 28, Section G will hold a joint session with the several botanical societies. Dr. B. M. Duggar, of the University of Wisconsin, retiring vice-president for Section G, will deliver an address on "Experimental Evidence upon the Nature of the Mosaic and other Plant Viruses." Dr. Duggar's address will be followed by three invitation papers: "Cell Physiology," by Dr. Charles F. Hottes, of the University of Illinois; "Epidemiology of *Puccinia graminis*," by Dr. E. C. Stakman, of the University of Minnesota; and "Dichogamy in Flowering Plants," by Dr. A. B. Stout, of the New York Botanical Garden. The Botanical Society of America will hold its annual meeting from December 28 to 30, under the presidency of Dr. Harley H. Bartlett, of the University of Michigan. Programs are being arranged for all five sections of the society and there will be joint sessions with Section G of the American Association, the American Phytopathological Society and probably with other societies. The physiological section of the Botanical Society will hold a round-table discussion on mineral nutrition. The general section will hold a round-table discussion on the teaching of botany. The annual dinner for all botanists will be held on Friday, December 30, at which time the address of the retiring president, Dr. L. H. Bailey, will be delivered. The American Phytopathological Society, in conjunction with its Southern Division, will hold sessions on Wednesday, Thursday and Friday, December 28, 29 and 30. Since this meeting is in the South, the plant-disease problems of that region will be emphasized. One session will be devoted to southern crop-disease problems, another to sweet-potato diseases and their control, and a third to tobacco diseases. But northern and western pathologists will find much to interest them in these conferences and in the other sessions that are being arranged. There will be joint sessions with Section G and with the mycological section of the Botanical Society of America, a conference on extension work in plant pathology, and a plant-disease-survey round-table discussion. The annual phytopathologists' dinner, with entertainment features, will be held at the Commercial Club on Thursday evening, December 29. The American Society of Plant Physiologists is arranging for three sessions at Nashville and it will hold a joint session with the Physiological Section of the Botanical Society. This is to occur Thursday morning. Joint sessions with the horticulturists and with the phytopathologists are also being arranged. Perhaps the most interesting feature of this meeting is to be a program in honor of the two-hundredth anniversary of the publication of Stephen Hales's "Vegetable Staticks." The programs of the Society of Plant Physiologists and the Physiological Section of the Botanical Society, are being arranged to avoid conflict this year. The Sam Davis Hotel, Commerce St. and Seventh Ave., is to be headquarters for all these botanical groups.

F–G. Organizations related to both Sections F

and G, Botanical and Zoological Sciences.—The regular annual meeting of the American Society of Naturalists will be held Friday afternoon, December 30. The session is to be devoted to a symposium on "Temperature and Life." The naturalists' dinner is planned for Friday evening. The Hermitage Hotel, Union St. and Sixth Ave., is to be headquarters for the society. The Ecological Society of America will hold its thirteenth annual meeting December 28 to 30. Besides the regular sessions of the society, joint sessions will be held with the Botanical Society of America, The American Society of Zoologists and the American Society of Naturalists. There will be an informal dinner for all who are interested in ecology. The Sam Davis Hotel, Commerce St. and Seventh Ave., is to be headquarters for ecologists. The American Microscopical Society will hold a business meeting on Wednesday, December 28, at 4:30. The Joint Genetics Section of the Botanical Society of America and the American Society of Zoologists will hold regular sessions for the presentation of papers on Wednesday, Thursday and Friday, December 28, 29 and 30. This organization will join with the Geneticists Interested in Agriculture in a symposium on "Irregularities of Chromosome Behavior in relation to Plant and Animal Improvement," to be led by C. B. Bridges and A. F. Blakeslee. The American Nature-Study Society will hold sessions on Tuesday and Wednesday, December 27 and 28. One session is to be devoted to nature education in the juvenile organizations associated with the Coordinating Council. This program is being arranged by Dr. Bertha C. Cady, of the Girl Scouts, and the session will have Dr. G. Clyde Fisher, of the American Museum of Natural History, as chairman. Another is to deal specially with nature education in the South. Papers are to be read by members from many different parts of the United States and the Nashville meeting promises to be specially successful. The Tulane Hotel, Church St. and Eighth Ave., is to be headquarters for the nature-study group.

H. Anthropology.—Section H will hold sessions from December 27 to 30. Dr. George L. Collie, director of the Beloit-Logan North African Expedition, will exhibit artifacts and skeletons taken from Aurignacian deposits in Algeria, and will present the results of recent exploration in that region. The subject of "Race Crossing, Group and Individual Changes," will occupy one day, while topics of general anthropological interest will also be presented. A session will be devoted to the evidences of human occupation of the caves of the Nashville region and to other questions of local archeology. The dinner for anthropologists is planned for Tuesday evening. The Tulane Hotel, Church St. and Eighth Ave., is to be headquarters for anthropologists.

I. Psychology.—Besides the separate session for Section I, at which technical papers will be read, there is to be a joint session of the section with the Southern Association for Philosophy and Psychology, and another with Section Q (Education). There will be a joint dinner with Section Q and the educational fraternity, Phi Delta Kappa, at which the vice-presidential addresses for the two sections will be heard. Dr. Margaret F. Washburn, the retiring vice-president for Section I, will deliver an address on "Purposive Action." The sessions in psychology are to be held early in the week and one may attend both these and the meeting of the American Psychological Association, which is to occur on Wednesday, Thursday and Friday, in Columbus, Ohio. The Southern Society for Philosophy and Psychology is to hold a special meeting this year in order to meet with Section I of the association. The regular meeting will be held in Lexington, Virginia, next spring, but the society is highly appreciative of the advantages of holding this special meeting with the section at Nashville. All members of the society are urged to attend if possible and to take part in the joint sessions on December 27. The Tulane Hotel, Church and Eighth Streets, is to be headquarters for philosophy and psychology.

K. Social and Economic Sciences.—Section K will not present a program for the Nashville meeting. It is hoped that the section may take part in the great four-yearly meeting at New York next year. Those who are actively interested in having Section K occupy a place in the American Association commensurate with the importance of its field are invited to contribute ideas and suggestions to the permanent secretary's office early in the year, so that plans for the New York meeting may be inaugurated in ample time. The annual meeting of the Metric Association will occur on Tuesday, December 27. The meeting will include conferences on the industrial, engineering and educational aspects of the project for the universal use of the metric system. The first of these will deal with national and international standardization from the standpoint of manufacturers. The engineering conference will deal with electrical, chemical and mechanical engineering in relation to metrology. In the educational conference teaching, text-books and measures for home and hospital will be discussed. Recent action by the General Federation of Women's Clubs endorsing metric legislation will be reported on. The annual "Metric dinner," at the Andrew Jackson Hotel, will close the meeting.

L. Historical and Philological Sciences.—Section

L of the association operates in two parts, one for that portion of history that deals with the history of science and the other for the linguistic aspects of philology. Those interested in the history of science will find that the Nashville program includes some very important topics presented by some of our best students in this field. The papers on the history of science are not to be brought together in special sessions, however, but will be distributed among the other sections with regard to their subjects. This year marks the two-hundredth anniversary of the death of Sir Isaac Newton and the centenary of the death of the Marquis de Laplace. Interesting and important papers on their relation to modern science are being arranged. In the field of chemical science there are to be papers on chemical anniversaries in 1927 and on the contributions of Marcelin Berthelot, the centenary of whose death has recently been appropriately celebrated in Paris. A program on the work and influence of Stephen Hales is being arranged by the American Society of Plant Physiologists; Hales's best-known publication, "Vegetable Staticks," appeared two hundred years ago, which gives occasion at this time for special attention to his scientific contributions. The general session Wednesday evening is to be devoted to an address on the life and work of the eminent astronomer Edward Emerson Barnard, whose birthplace was Nashville. As to linguistic science in Section L, the special committee that has for several years done such excellent work in arranging programs in this subject has not been active this year. With the affiliation of the Linguistic Society of America with the American Association, that society was requested to arrange a linguistic program for this meeting, which it cordially undertook to do, although its regular meeting does not occur at Nashville. A special committee of the society has prepared an excellent program for Friday, December 30. Professor G. M. Bolling, of the Ohio State University, will present a paper entitled "Phonetic Laws admit of no 'Exceptions.'" Professor C. M. Lotspeich, of the University of Cincinnati, will speak on "Sound Symbolism." Professor T. Michelson, of the Smithsonian Institution, will present "Some Algonquian Notes." "The linguistic aspects of a tenth-century Byzantine paraphrase of Onasander" will be discussed by Professor Clarence G. Lowe, of Washington University, St. Louis, and "The Latin vi-perfect" is the subject of a paper to be presented by Professor W. Petersen, of the University of Florida. Professor Leonard Bloomfield, of the University of Chicago, and several other well-known scholars will also take part in this program. Headquarters for Section L will be the Hermitage Hotel, Union St. and Sixth Ave.

M. Engineering.—Section M is planning a morning and an afternoon session for Wednesday, December 28. In addition to the retiring address of the vice-president .for the section, who is Dr. C. R. Richards, of Lehigh University, the morning session will include addresses on such subjects as Hydroelectric Development, Radio Engineering, the Earthquake Situation in the Mississippi Valley, and similar questions of both broad and local interest. The afternoon program is being arranged by a committee of engineers of Nashville, Memphis and Chattanooga, of which Dean W. H. Schuerman is chairman. This is to deal with local problems, especially those with broad application. There will also be a dinner arranged by the local engineers, with the speaker provided by the section. Engineering headquarters will be the Andrew Jackson Hotel, Deadrick St. and Sixth Ave.

N. Medical Sciences.—Section N, which endeavors to arrange for its sessions discussions in fields where medical sciences and other lines of research overlap, is planning two half-day symposia for the Nashville meeting. The morning session will be held jointly with Section C (Chemistry). It will be devoted to "Contributions of Other Sciences to Medicine," with the following papers: E. C. Kendall, of the Mayo Foundation, University of Minnesota, "Contributions of the Chemist to our Knowledge of Biological Oxidations." G. H. Whipple, dean of the Medical School, University of Rochester, "Contributions of the Biochemist to our Knowledge of Blood in Formation and within the Body." Alfred F. Hess, of New York University and Bellevue Medical College, "Contributions of Chemistry, Physics and Pathology to our Understanding of Rickets." L. G. Wesson, of the Medical School of Vanderbilt University, "Relationship of Plant Vitamins to Human and Animal Metabolism." Aleš Hrdlička, of the U. S. National Museum, "Contributions of Anthropology to Medicine." The afternoon session is to be a joint meeting with the American Public Health Association, on the topic "The Medical Problems of the South." It will be opened by the retiring vice-president for the section, Dr. Rufus I. Cole, director of the Hospital, Rockefeller Institute for Medical Research, who will speak on "The Interrelationship of the Medical Sciences." Other speakers will be Colonel A. M. Stimson, Assistant Surgeon-General, U. S. Public Health Service, Dr. C. C. Bass, of the Medical School of Tulane University, and Dr. R. S. Cunningham, of Vanderbilt University, who will discuss malaria in the South, parasitological problems in the South and tuberculosis in the South. Headquarters for Section N will be the Andrew Jackson Hotel, Deadrick St. and Sixth Ave.

O. Agriculture.—In cooperation with the Association of Economic Entomologists and the Society of Agronomy, Section O is arranging a half-day symposium on "The corn-borer situation," for Tuesday afternoon, December 27. The annual dinner of the section will be the occasion for the presentation of the address of the retiring vice-president for the section, Dr. C. F. Marbut, of the U. S. Department of Agriculture, who will speak on "A Hitherto Neglected Factor in the Agricultural Situation." The American Society for Horticultural Science will meet from Tuesday to Thursday, December 27, 28 and 29. A general session on Tuesday morning will have papers mainly on different phases of tomato culture. In the afternoon will be sessions on vegetable culture and pomology. Two sessions on Wednesday will deal with (a) "Pollination, Sterility, Fruit-setting, and Spraying," and (b) "Nutritional Relations of Fruit Trees." The Thursday morning session will consider root stocks, propagation, pruning. The afternoon session will be devoted to the address of the president of the society, a business meeting and papers on fruit investigations. The dinner of the society will occur on Wednesday evening. Headquarters for horticulturists will be the Tulane Hotel, Church St. and Eighth Ave.

Q. Education.—Section Q is planning sessions to occupy three days at Nashville, on December 26, 27 and 28. On Monday there will be a session on supervision and one on methods. Among the speakers' names are Courtis, Hennon, Hull, Waples, Gray, Barr, Gates and Ayer. Tuesday is to be devoted to school administration, some of the speakers' names being Strayer, Packer, Englehardt, Clark, Phelps, Ayer, Alexander and Monroe. An annual summary of research will occupy Wednesday, with papers by Courtis, Cade, Garth, Lentz, O'Brien, Pechstein, Cook, McGregory, Donovan, Purdon and others. The retiring vice-presidential address for Section Q will be given Tuesday evening by Dr. Melvin E. Haggerty, dean of the college of education of the University of Minnesota, at the joint dinner-meeting of Sections I and Q and the Phi Delta Kappa Fraternity. The Tulane Hotel, Church St. and Eighth Ave., is to be headquarters for philosophy and psychology. Phi Delta Kappa headquarters will be the Andrew Jackson Hotel, Deadrick St. and Sixth Ave.

Organizations not Classified by Sections of the Association.—The Society of the Sigma Xi is to hold a business session and its annual dinner on Tuesday, December 27. The sixth annual Sigma Xi lecture, by Dr. Clarence Cook Little, president of the University of Michigan, on "Opportunities for Research in Mammalian Genetics" will be given at the general session of the association on Tuesday evening. The Tennessee Academy of Science will hold its annual meeting at this time. There will be a special session Monday morning at 10, to welcome visiting members of other academies. The academy is specially interested in the movement to provide opportunities by which the many state academies may cooperate for mutual benefit. The academy will have on exhibition throughout the week a collection of photographs, publications, etc., of the late Edward Emerson Barnard, medals awarded to him, and other Barnardiana. Several scientific fraternities are to have business sessions and dinners in the period of the Nashville meeting, without scientific programs. To be mentioned here are the Gamma Alpha Graduate Scientific Fraternity, the Honor Society of Phi Kappa Phi, the Sigma Delta Epsilon Graduate Women's Scientific Fraternity, the Pi Mu Epsilon Mathematical Fraternity and the Beta Beta Beta National Biological Honor Fraternity.

FURTHER ANNOUNCEMENTS AND REPORTS OF THE NASHVILLE MEETING

Later announcements about the approaching meeting will be made in SCIENCE, and full information will be contained in the General Program, which will be available in the registration offices Monday morning, December 26, and throughout the week of the meeting.

It is planned that a general report of the second Nashville meeting will appear in special issues of SCIENCE to appear on January 27 and February 3. These will contain accounts of the main features of the convention, the business transacted, and especially a full series of readable reports on the section and society programs, the latter reports based on material to be supplied by the secretaries of those organizations. These will be sent to all members. New members who join the association before the time of their publication and all associates for the Nashville meeting will receive the special issues.

SCIENTIFIC EVENTS

THE NEW BIOLOGY BUILDINGS AT THE UNIVERSITY OF BIRMINGHAM

THE new buildings of the University of Birmingham at Edgbaston, which were opened by the prime minister on October 20, will accommodate the departments of botany, zoology and brewing and the biochemistry of fermentation, which have long been inadequately housed in the older part of the university in Edmund Street.

The additions are the fulfilment of a further portion of the original design of Sir Aston Webb. Sir William Waters Butler, Bt., has contributed £40,000 and an anonymous donor £5,000 towards the total cost of

the buildings and equipment, which exceeds £120,000. Zoology occupies the ground floor, brewing and biochemistry of fermentation the greater part of the first floor and botany the second floor, with certain rooms also on the first floor.

The departments have already started work in the new buildings, although the internal equipment and furnishing are not yet complete. Apart from facilities for teaching, the zoological department is admirably equipped for research. A large sum of money has been expended on apparatus, which includes elaborate instruments used in the newer experimental development of the science. The necessity of having the means of keeping marine animals alive far away from the sea has been recognized, and tank rooms have been provided, containing aquaria, with arrangements for filtering, circulating and aerating the sea-water, which will be obtained from Plymouth. The new department is particularly well equipped for entomological teaching and research, there being a special room for this work in the building itself and an outdoor laboratory for insect-breeding work, and students will have access to a large fruit farm in Worcestershire for a part of their field training in the agricultural aspect of the subject. The brewing and biochemistry of fermentation department consists of a series of sixteen rooms. There is a spacious general laboratory, a well-appointed microscope room and a research laboratory. A special laboratory is provided for analysis, as well as an incubator room and dark rooms for photography and polarimetric work. The laboratories are equipped with the latest forms of apparatus in addition to recent researches on starch investigations.

The new botanical department comprises some thirty-three rooms, and the laboratories are especially fitted for studying fungi by the method of pure cultures, while ample provision has been made for the study of plant physiology by experiments in which open air is necessary.

DARWIN'S HOME FOR THE NATION

IN his presidential address to the British Association, Sir Arthur Keith made an appeal for a fund to purchase Darwin's home at Downe in Kent, where he did most of his epoch-making work, so that it might be preserved for the nation. According to the London correspondent of the *Journal* of the American Medical Association the appeal met with a prompt response. Mr. George Buckston Browne, a retired genito-urinary surgeon, on reading the appeal at once telegraphed to Sir Arthur offering to make himself wholly responsible for the gift. His motive was to allow future generations to see Darwin's home, which, with its estate, might otherwise pass into the hands of builders. The cost, with some endowment fund, is estimated at from $60,000 to $75,000. Mr. Browne has made it a condition that no other contributor is to be asked to share the cost with him. He was admitted to the membership of the College of Surgeons in 1874, and for fourteen years acted as assistant to Sir Henry Thompson, the leading genito-urinary specialist of his day. He is an antiquarian and an enthusiastic collector. In offering to buy Downe House and to establish a fund for its perpetual upkeep, he is giving expression to his profound admiration for the work of the great naturalist. He considers that the house in which evolution was cradled should be as reverently preserved as Shakespeare's birthplace. He desires that the house should be restored as nearly as possible to its condition when Darwin lived there. When the house and garden have been restored, he would wish them to be opened without charge to visitors, who could then be shown Darwin's study, laboratory and living rooms much as when he left them. He also expressed the wish that some physician of slender means and good record should be appointed the custodian. Sir Arthur Keith has suggested that out of the endowment fund money should be spared for a prize to be given every second year for the best contribution to biologic knowledge. Downe House is the property of Darwin's son, Professor Francis Darwin and is now used as a school for girls.

BUILDING ACTIVITIES OF THE CHICAGO ZOOLOGICAL SOCIETY

THE report of the first year's building activities of the Chicago Zoological Society shows the new park to be well under way and much construction work already completed. According to a summary in *Museum News*, it is now estimated that the major portion of the work will be completed by June 1, 1930, and that the park will be opened to the public at that time.

During the past few months the new park, which is located to the west of the city proper and just outside the town of Riverside, has been entirely fenced in. Within this enclosure are 133 acres of land and fifty additional acres are available for future development. Over ten miles of sanitary and surface sewers have been laid. Water mains have been laid and heating and power lines put in place.

The excavations for three separate lagoons are nearly complete, as well as the construction of a complete power and pumping station. Work has already been started on the group of buildings at the entrance. These will house the administration offices, curators, head keeper, forester, director, the society's meeting room and library. The only exhibition building to be started this year is the reptile house. In addition to the work being done within the new park,

the county has begun the construction of roads which will connect the zoo with the main boulevards of the vicinity.

It is felt that the plan for the park embodies some noteworthy features made possible by a study of existing parks in Europe and in this country, and by the fact that the entire park is being planned at one time upon a large scale. Automobile traffic is being entirely separated from pedestrians and will follow a circular roadway just inside the fence.

A system of deep moats is to be used in the place of bars to confine the animals whenever possible. This and other arrangements will do much to avoid the cramped conditions often prevailing in zoological gardens.

While nothing has been done as yet toward acquiring a collection for the new park, a tentative list of inhabitants has been worked out. This includes 876 specimens of mammals divided into 269 species; 2,398 birds of 794 species; 300 reptiles representing 75 species, and 90 batrachians of 30 species. There will also be an insect collection including about 200 species.

SCIENTIFIC NOTES AND NEWS

DR. FREDERIC A. LUCAS, honorary director of the American Museum of Natural History, has been elected an honorary member of The Museums Association, Great Britain. This is the first time that the distinction, restricted to fifteen persons, has been conferred upon any one outside of Great Britain.

IN addition to the medals awarded to Dr. W. D. Coolidge, Professor A. A. Noyes and Professor J. C. McLennan previously announced in SCIENCE, the Royal Society has awarded a royal medal to Sir Thomas Lewis, F.R.S., for his researches upon the vascular system, following upon his earlier work on the mammalian heart-beat; the Copley medal to Sir Charles Sherrington, O.M., F.R.S., for his distinguished work on neurology, and the Buchanan medal to Dr. Major Greenwood for his statistical researches and other work in relation to public health.

DR. GRAHAM LITTLE, member of parliament, for London University, has been elected an honorary member of the Royal Academy of Medicine of Rome, and a fellow of the Royal Society of Physicians of Budapest.

A SPECIAL number of the *Zeitschrift für physikalische Chemie* has been dedicated to Professor Ernst Cohen, of the University of Utrecht, to commemorate the twenty-fifth year of his professorship.

PROFESSOR PAUL LECENE, who occupies the chair of surgical pathology in the Paris Faculty of Medicine, has been nominated an officer of the Legion of Honor.

DR. LEE K. FRANKEL, former president of the American Public Health Association, will be guest of honor at a testimonial dinner to be given on December 9 at the Biltmore Hotel by friends associated with him in health work. The speakers will include Felix M. Warburg, Professor C-E. A. Winslow and Haley Fiske.

SIR CHARLES MARTIN, director of the Lister Institute, upon whom the honor of knighthood was recently conferred, has been presented with his portrait by the staff of the institute as a token of personal esteem and appreciation of his great services during the twenty-four years of his directorship. The presentation of the portrait took place in the library of the institute on October 28, when Professor Harden presided over a large company of past and present members of staff and research workers.

FREDERIC S. LEE, research professor of physiology in Columbia University, has resigned the presidency of the board of managers of the New York Botanical Garden after a service of five years.

AT the annual meeting of the American Ornithologists' Union held at the U. S. National Museum from November 14 to 17, the following officers for the year 1926–1927 were elected: Alexander Wetmore, assistant secretary of the Smithsonian Institution, *president;* T. S. Palmer and W. L. McAtee, of the U. S. Biological Survey, *secretary and treasurer.*

THE following officers have been elected by the American Society of Agronomy: Dr. A. G. McCall, *president;* Dr. E. F. Gaines, *first vice-president;* Dean M. J. Funchess, *second vice-president;* Professor W. W. Burr, *third vice-president;* Dr. A. B. Beaumont, *fourth vice-president;* Professor J. D. Luckett, *editor,* and Dr. P. E. Brown, *secretary-treasurer.*

DR. WALTER L. NILES, dean and professor of clinical medicine of Cornell University Medical College, was elected president of the Association of American Medical Colleges at its recent annual meeting in Montreal; Dr. Burton D. Myers, assistant dean and professor of anatomy, Indiana University School of Medicine, Indianapolis, vice-president; Dr. Irving S. Cutter, dean and associate professor of medicine, Northwestern University Medical School, Chicago, chairman of the executive committee, and Dr. Fred C. Zapffe, 25 East Washington Street, Chicago, secretary-treasurer. The next annual meeting will be at Indianapolis from October 29 to 31, 1928.

AT the annual general meeting of the Mineralogical Society, England, held on November 1, Dr. G. T.

Prior, keeper of the department of minerals in the British Museum, was elected president.

DR. SYLVAN J. CROOKER, formerly with the U. S. Bureau of Standards, has resigned his position as chief engineer of the Whitlock Coil Pipe Company, Hartford, Conn., to become vice-president of the Heat Transfer Products, Inc., a division of the Staten Island Shipbuilding Company, New York City.

HAAKON WEXELSEN, who has been a graduate student in genetics at the University of California for the past year and a half, has been appointed director of Felleskjoepels Experiment Station at Vidarshof, Norway.

A. W. ALLEN was recently appointed editor of *Engineering and Mining Journal*, succeeding J. E. Spurr.

DR. WILBERT W. WEIR, associate soil technologist of the U. S. Bureau of Chemistry and Soils, has accepted a position on the staff of the Chilean Nitrate of Soda Educational Bureau, with headquarters in New York City.

DR. R. E. CLAUSEN, associate professor of genetics at the University of California, has recently returned from sabbatical leave after an absence of fifteen months in Europe. The first twelve months were spent at Stockholm, where he worked in the cytological laboratories of Dr. O. Rosenberg. During the remaining three months he was engaged in an inspection of the research in genetics under way in Europe for the International Education Board, under which he held a fellowship.

DR. FREDERICK G. KEYES, head of the department of chemistry at the Massachusetts Institute of Technology, has arrived in Boston from Paris after an absence of five and a half months, to resume his duties with the department. While in Paris Dr. Keyes acted as representative of the institute at the Marcelin Berthelot centenary memorial.

DR. ROBERT L. PORTER, recently appointed dean of the University of California Medical School, has arrived in San Francisco to take up his new duties after spending three years in study in Rome. While on leave Dr. Porter visited medical schools in Italy, France, Great Britain, Canada and the United States.

DR. H. NOGUCHI, of the Rockefeller Institute, arrived in Accra, on the British Gold Coast, on November 17, to investigate the yellow fever problem.

DR. NIELS NIELSEN, the Danish explorer, has returned to Denmark after a difficult expedition to unknown parts of the interior of Iceland, on which expedition he was accompanied by P. Hannesson and Sturla Jonsson, both Icelanders.

DR. A. W. HILL, director of the Royal Botanic Gardens at Kew, sailed for Australia on November 4 on the invitation of the Commonwealth Council for Scientific and Industrial Research, Melbourne. He will visit the various botanical, agricultural and forestry Institutions in Western Australia, and will then proceed to Adelaide, Melbourne, Sydney and Brisbane.

DR. ANTOINE LACASSAGNE, assistant director of the Radium Institute of the University of Paris, and Professor Hermann Holthusen, of Hamburg, recently spent a few days in New York visiting hospitals and institutions where radium and X-rays are used in the treatment of cancer. Both expect to visit other American cities before going to New Orleans to attend the meeting of the Radiological Society of North America.

PROFESSOR H. N. RUSSELL, of Princeton University, gave a talk at the U. S. Bureau of Standards on November 4, on "The Structure of the Elements of the Iron Group." On October 15, J. W. French, technical director of Barr and Stroud, Ltd., manufacturers of military optical instruments, Glasgow, lectured on "Optical Glass" at the bureau.

DR. W. V. BINGHAM gave an address before the British Psychological Society at the Royal Anthropological Institute, London, on November 2, on "Individual Differences in Susceptibility to Accidents." He has now returned to New York, after visiting technopsychological laboratories in France, Switzerland, Holland, Germany and England. While in Paris he contributed to the Fourth International Conference for Technopsychology a paper on "Neglected Methods in Employment Psychology," and was elected a member of the board of directors of the association.

DR. WALTER S. ADAMS, director of the Mount Wilson Observatory of the Carnegie Institution of Washington, will give a lecture on "The Interior of a Star and how it maintains its Life" on December 6 in the administration building of the institution in Washington.

PROFESSOR ROSWELL JOHNSON, head of the oil and gas school at the University of Pittsburgh, addressed the Sigma Xi alumni club of the University of Pittsburgh on November 29 in the physics lecture room. His topic was "Science in Russia."

DR. DANIEL T. MACDOUGAL, director of the laboratory of plant physiology of the Carnegie Institution of Washington, will read a paper on "Substances regulating the Passage of Materials into and out of

Plant Cells—the Lipoids" before the American Philosophical Society, Philadelphia, on December 2.

DR. HENRY J. VAUGHAN, commisisoner of health of Detroit, gave one of the DeLamar lectures in hygiene at the Johns Hopkins University School of Hygiene and Public Health, November 15, on "Municipal Health Administration."

DR. A. F. SHULL, professor of zoology in the University of Michigan, recently addressed the department of biology of Princeton University on "Photoperiodism and the Wings of Aphids."

A MEETING commemorating the bicentenary of the death of Sir Isaac Newton was held at the American Museum of Natural History on November 26 and 27, under the auspices of the History of Science Society and other scientific organizations, at which many distinguished speakers took part. It is hoped to print a full account of the meeting in an early issue of SCIENCE.

A FORMAL ceremony was held at the Warren Anatomical Museum on November 18, when a framed portrait of Dr. William Fiske Whitney, former curator of the museum, was unveiled and presented to the Harvard Medical School. Dr. Burt Wohlbach introduced Dr. George Burgess Magrath, who presented the painting. Dr. Magrath outlined his contact with Dr. Whitney, first as a student and later as a colleague. He portrayed Dr. Whitney as a pioneer clinical microscopist, a councilor of surgeons, a gentleman. Dr. Edsall, dean of the medical school, received the portrait in the name of the school. He showed that Dr. Whitney, in his forty-two years of service from 1879–1921 as curator, made the museum what it is to-day, and yet through all the hard work carried himself graciously and kindly.

DR. ISRAEL C. WHITE, state geologist for West Virginia since 1897, died on November 24 at the age of seventy-nine years.

PROFESSOR FRANK WASHINGTON VERY, director of the Westwood Astrophysical Observatory at Westwood, Mass., and formerly professor of astronomy at Brown University, died on November 23, aged seventy-five years.

DR. GEORGE ABBOTT OSBORNE, Walker professor-emeritus of mathematics at the Massachusetts Institute of Technology, died on November 20, aged eighty-eight years.

DR. ALFRED J. M. PAGET, formerly regius professor of physic, University of Cambridge, died on September 15.

SIR WILLIAM GALLOWAY, the distinguished British mining engineer, died on November 2, aged eighty-seven years.

THE death is announced, at the age of seventy-six years of Professor Carlo Fedeli, formerly director of the institute of special medical pathology at the University of Pisa.

THE next World's Dairy Congress will be held in London, England, from June 26 to July 14, 1928. The program as outlined in the preliminary announcements includes papers on all phases of the milk industry and discussions will be led by various American scientists including H. E. Van Norman, O. F. Hunziker, E. V. McCollum, M. D. Munn and R. S. Breed. An official delegation of dairy scientists from the United States will leave Montreal for the congress on May 15 and June 15, under the direction of R. S. Breed and G. J. Hucker, of Geneva, N. Y.

A SPECIAL meeting was held on November 22 at the New York Academy of Medicine at which various aspects of the cancer problem were discussed. Dr. H. Gideon Wells, of the University of Chicago, spoke on "The Significance of Cancer Statistics," and Dr. I. V. Hiscock, associate professor of public health at Yale University, discussed his paper. Dr. Maud Slye, associate professor of pathology at the University of Chicago, talked on the relation of heredity to cancer. Her paper was discussed by Dr. James Ewing, professor of pathology, of Cornell University Medical College. "How the Cancer Problem is handled in Massachusetts" was the title of a paper by Dr. Kendall Emerson, of the State Cancer Clinic, Worcester, Mass., which was discussed by Dr. E. H. Lewinski-Corwin, committee on public health relations, New York Academy of Medicine. Dr. Samuel W. Lambert, president of the New York Academy of Medicine, presided.

THE United States Civil Service Commission announces an open competitive examination for senior chemical engineer (pulp and paper), applications for which must be on file with the Civil Service Commission at Washington, D. C., not later than December 27. The examination is to fill a vacancy in the Forest Products Laboratory at Madison, Wis., and vacancies occurring in positions requiring similar qualifications. The salary ranges from $5,200 to $6,000 a year, depending upon the qualifications of the appointee as shown in the examination and the duty to which assigned.

THE American Society of Agronomy, at its recent annual meeting, voted to sponsor a $5,000 nitrogen research award, provided by the Chilean Nitrate of Soda Educational Bureau. The award is given annu-

ally to individuals who have performed outstanding nitrogen research in relation to economic crop production to be used in furthering nitrogen investigations or for professional advancement. The award is to be made by a committee of six appointed by the president of the American Society of Agronomy and the amount of the award is to be determined by the committee in each individual case. In making the award the committee shall consider the work accomplished as indicated by publications and the facilities and funds available for the particular research project. The award may be made to any research worker in the United States or Canada. The award is to be made annually at the meeting of the American Society of Agronomy. The award committee has not yet been named but will be announced soon.

DR. LESLIE A. KENOYER, of Western State Teachers College, Kalamazoo, has presented to the U. S. National Herbarium a collection of about six hundred plants obtained on Barro Colorado Island, Panama, during July and August. The collection contains about 190 species previously unreported for the island, about four of which are new species. The collector is collaborating with Dr. Paul C. Standley in a publication of these additions to the flora of the island.

AT the direction of King Albert a national scientific research fund was constituted on November 26 at a special meeting of the Belgian Academy, called to meet the urgent necessity of raising money to promote research in connection with Belgian institutions of learning.

IT is announced that James N. Gamble, of Cincinnati, plans to give funds to Christ's Hospital for the establishment of an institute for medical research. The amount is not stated but is said to be several millions of dollars. Mr. Gamble recently gave $500,000 to the building fund of the hospital.

THE class of '30 at Lehigh University has raised $3,000 for two chemical research fellowships, to which H. C. Jones, of Wilkes-Barre, and R. J. De Gray, of Ramsey, N. J., have been appointed.

A GIFT of $40,000 from the John A. Finch estate will make possible the erection of a thirty-five bed hospital on the campus of Washington State College at Pullman which, it is expected, will be completed by September, 1928, and will cost about $85,000.

THE department of mineralogy and petrography at Harvard University was enabled, through the Holden Travel Fund, to send out four parties during the past summer for the collection of material for research and exhibition at the university museum. Harry Berman, museum assistant, went to Mexico on a joint collecting trip with Dr. W. F. Foshag, of the United States National Museum. A third expedition was made by Professor E. S. Larsen, who went to southern California in the vicinity of Elsinore, where he mapped the geology of a region hitherto undescribed. The research will be continued next summer. Professor Charles Palache and L. W. Lewis visited a number of mines in Canada, bringing back collections for exhibition from the silver mines of Cobalt, Ontario and the Lucey Mica Mine at Sydenham, Canada.

AT the opening of the present academic year four members of the staff of the Clark School of Geography went into camp with twenty-five graduate students, with plans for making an economic survey of Greenfield, Massachusetts, and vicinity. The camp was placed in the Berkshire Hills, three miles west of Greenfield. There is a two-fold purpose in the establishment of this field school of geography: one is to provide definite training in field methods for those entering the profession; the other is to experiment in the development of field methods in geography, and in the working out of an economic survey of a portion of the Connecticut Valley and bordering uplands, which would be of value to the people living in that community. The plans have been made to take successively portions of the Connecticut Valley lowland and continue the work until a considerable section of that part of New England has been studied intensively. The instructional work was under the direction of Drs. Wallace W. Atwood, Clarence F. Jones, W. Elmer Ekblaw and Charles F. Brooks.

THE topographical department of the Danish general staff despatched a survey expedition to Greenland last May. It is under the command of Captain F. C. Jorgensen and is based on Disko Island. The projected program of survey work will probably take thirty years to carry out. In addition, the expedition will supervise the construction of seismographic and wireless stations at Scoresby Sound.

AN Italian Arctic expedition by airship is being planned for next year. According to the foreign press, the expedition will be organized and led by General U. Nobile, who accompanied Captain R. Amundsen in his polar flight in 1926. The Italian government has offered airship N.4, which is a sister ship of the *Norge*, used on that occasion, and the Norwegian Aero Club has promised the use of airship sheds at Vadsö and King's Bay. General Nobile intends to make his Arctic base in Spitzbergen and to explore eastward to the north of Siberia, intending no doubt to throw light on the unknown northward extension of Nicholas Land. He proposes also to make a flight to the Pole. The Soviet government has expressed a wish to help by establishing a base with supplies at the mouth of the Yenisei River. At present a com-

mittee at Milan is considering the cost of the project. The Royal Italian Geographical Society has promised its support.

THE U. S. National Museum recently received as a gift the collection of insects belonging to Geo. M. Greene, of Harrisburg, Pennsylvania. Mr. Greene began to form this collection in 1893 and devoted himself principally to Coleoptera, although his collection contains several thousand named and arranged specimens in other orders. The collection is of unusual value because the specimens are neatly and completely labeled, well mounted and thoroughly classified. The beetles alone number over 42,000 specimens. H. S. Barber and C. T. Greene, of the U. S. Bureau of Entomology, made a trip by automobile to Philadelphia on October 21 and 22, to bring the Geo. M. Greene collection to the museum.

UNIVERSITY AND EDUCATIONAL NOTES

UNDER the will of Frank Thorne Patterson, of Philadelphia, his estate, after the death of his widow, is to be divided between Jefferson Medical College, the hospital of the University of Pennsylvania, Pennsylvania Museum and the School of Industrial Art and Bryn Mawr Hospital. The value of the estate is estimated at approximately $2,120,000.

THE late Nina Lea, of Philadelphia, has bequeathed to the University of Pennsylvania and Harvard University $150,000 each, to endow professorships in memory of her father, Henry Charles Lea, well-known historian.

DR. A. F. O. GERMANN has been granted a leave of absence from Valparaiso University, to return to his former position of research director for the Laboratory Products Company, Cleveland. Harry V. Fuller, formerly professor of chemistry at Pei Yang University, China, has accepted the position of acting professor of chemistry at Valparaiso University in Professor Germann's absence.

DR. GORDON WHYBURN has been promoted to a full professorship of mathematics at the University of Texas.

BRENTON R. LUTZ, of the department of biology at Boston University, has been promoted from assistant professor to professor in the department.

DR. ELMER L. SEVRINGHAUS has been transferred from associate professor of physiological chemistry to associate professor of medicine and associate physician to the Wisconsin General Hospital, Madison, and Dr. Edgar J. Witzemann, formerly of the Mayo Clinic, has been appointed assistant professor of physiological chemistry, to succeed Dr. Sevringhaus.

DR. LESLIE HELLERMAN, who has been research instructor at the University of Chicago, has received an appointment in the department of physiological chemistry of the Johns Hopkins University Medical School as associate.

MISS MINNIE A. GRAHAM, associate professor of chemistry at Mills College, has been appointed professor of chemistry in the Dominican College of San Rafael.

DISCUSSION AND CORRESPONDENCE

TUMORS IN THE LOWER CARBONIFEROUS

UNUSUAL growths on the fin spines of modern fishes have been known for a long time under the name of Osteomae. They are hard, dense and almost ivory-like. I do not know what produces these pathological growths, since no one has studied them for the determination of this point, so far as I know. While summarizing our knowledge of pathological conditions[1] among fossil vertebrates I mentioned these growths as possible tumors, and stated that they were unknown among fossil fishes.

Recently Mr. Errol Ivor White[2] has sent me his paper describing a collection of fishes from sections of the Lower Carboniferous rocks below Newton Farm in the parish of Foulden, five miles west of Berwick-on-Tweed, by the youthful Thomas M. Ovens, whose death at the age of nineteen cut short what might have been a marvelous intellectual career.

One of the incomplete specimens of *Phanerosteon mirabile* Traquair shows on the anal radials "bladder-wrack"[3] osteomae, which are so common in some types of living fishes. This discovery is not only the first of the fossil osteomae, but it is the earliest geological record of any pathological growth in the vertebrate group. It is the earliest pathological record.

ROY L. MOODIE

SANTA MONICA, CALIFORNIA

MASTODON REMAINS IN WASHINGTON

ABOUT the middle of August there was found on the property of Virgil Schaefer, about four miles northeast of the village of Blyn, Clallam County, Washington, some remains of a mastodon. Because of the

1 "Paleopathology, an Introduction to the Study of Ancient Evidences of Disease." Chapter iii. Urbana, 1923.

2 "The Fish Fauna of the Cement Stones of Foulden, Berwickshire." *Trans. Roy. Soc. Edinburgh*, LV, pt. I (No. 11), p. 268, 1927. Text figure 19, A.

3 A seaweed, *Fucus vesiculosus*, yielding material prescribed for obesity, goiter, etc.

location, the northeast corner of the Olympic Peninsula, the matter seems worthy of record.

The find included two tusks in a fair state of preservation, one entire and one broken in two. The tusks were 64 and 64 3/16 inches long, respectively, the measurement being made on the outer curve. The diameter at the base was slightly over 20 inches. The weight was estimated at 35 pounds.

Just below the base of the tusks, which were in a horizontal position, were five teeth and a number of bony fragments, presumably of the jaw. One tooth comprised five sets of triple protuberances which were well pointed. Another tooth comprised four sets of triple protuberances with a fifth small stub. The enamel in both of these was in good condition. The other three teeth, each three and one-half to five and one-half inches long, comprised three sets each of double protuberances, in one case worn down about three-fourths of an inch, in the second, worn slightly more, and in the third, the smallest of the group, worn to the base of the points.

The bones were found in the course of the digging of a ditch to drain a swampy area which has been a beaver swamp within the memory of the present inhabitants of the region. The following section was exposed in the trench:

a. peaty bog muck, 2 feet 0 inches; b. marly clay, 0 feet 1 inch; c. peaty clay, dark, 2 feet 6 inches; d. sandy clay, fossiliferous, 1 foot 0 inches (base concealed).

The fossils have not been studied, but include abundant fragments of minute gastropods and other shells. The mastodon remains were in the layer c. approximately three feet below the present surface of the swamp, which is not far above sea-level.

HAROLD E. CULVER
STATE GEOLOGIST OF WASHINGTON

AVAILABLE MATERIAL IN COMPARATIVE ANATOMY AND PATHOLOGY

THE Laboratory of Comparative Pathology of the Philadelphia Zoological Society has rather extensive material of anatomical and of pathological character, some of which is not entirely used by the laboratory personnel. It has been our policy to supply to accredited investigators a moderate amount of material for their problems.

I am writing this letter to make it more generally known that material is available, because we wish no opportunities lost to be of service to workers in these general lines. This material will be given to research and teaching institutions that receive the approval of the American Association for the Advancement of Science. It will be sold to dealers whose business it is to distribute material.

Since this laboratory has no shipping department, it will be necessary for workers who desire material to supply us with mailing and express cases suitable for the specimens they desire, and to pay postage and expressage. The laboratory can not engage to embalm or inject tissues free of charge, but may be able to undertake small problems of this kind for the time-cost of the labor.

There are now available a moderate number of male and female genital tracts and of intestinal tracts. A few central nervous systems and ductless glands may also be supplied, but many of these in our laboratory are already preempted. The group specimens are grossly normal, but have not been investigated microscopically.

In so far as pathological material is concerned, the laboratory will supply only what develops in the routine autopsies and is not needed for museum purposes. Specimens needed for the collection, and those already mounted for the museum will not be supplied.

HERBERT FOX
THE ZOOLOGICAL SOCIETY
OF PHILADELPHIA

REPORT OF THE RANSOM MEMORIAL COMMITTEE

THE committee which has been in charge of the establishment of a memorial to the late Dr. Brayton H. Ransom, after a careful study of the opinions expressed in answer to a questionnaire on the subject and a consideration of the limitations placed on the choice of a memorial by the size of the fund, has come to a decision as to the form to be taken by the memorial. It has been decided that the fund be invested and that the interest be used as a money prize of $100 when that amount is available, to be awarded by the committee to a person of any nationality who has not passed his fortieth birthday at the time of the award, and who has made a comparatively recent noteworthy contribution in the field of parasitology.

The fund at present totals $930 in actual subscriptions and $135 in unpaid pledges, approximately 100 persons, representing fifteen countries in addition to the United States, having cooperated in bringing the fund to its present status, the individual contributions ranging from $1 to $100.

The fund has thus far been kept in a savings account drawing the usual interest, in the hope that a $1,000 total might be actually available for investing in a more remunerative manner; the question of investment is now being carefully investigated by the committee.

It is hoped that outstanding pledges will be paid in the near future and that any persons still desirous of joining in the establishment of this memorial to Dr. Ransom will not delay longer.

ELOISE B. CRAM,
Secretary, Ransom Memorial Committee
BUREAU OF ANIMAL INDUSTRY,
WASHINGTON, D. C.

SCIENTIFIC APPARATUS AND LABORATORY METHODS

A SIMPLE DEVICE FOR WASHING CULTURE TUBES

ONE of the most irksome and time-consuming operations of the bacteriological laboratory is the washing of culture tubes. Recently, we have been using a very simple piece of apparatus which has proved to be so satisfactory in this laboratory that we believe others will find it useful.

The device consists of a water-motor which attaches directly to the faucet by means of a screw connection. A 4-inch motor furnishing ⅛ h. p. on 80 pounds water pressure with a free speed of 4,500 revolutions per minute is used. Because of its simplicity, cheapness and ease of control this motor appears to be more satisfactory for the purpose than an electric motor. The test-tube brush is attached to the motor shaft by means of a metal chuck. We have found it more satisfactory to employ only about two inches of the bristle-tipped portion of the brush in a chuck about six inches long. This arrangement causes the brush to revolve steadily when running free and facilitates insertion into the tube. Brushes with straight bristle-tipped ends have been found more satisfactory than the newer kinds with the so-called "spray tuft" end. After the tubes have been given the preliminary preparation for brushing they can be handled rapidly and with much less breakage than by the method of hand brushing. The rate should approximate 800 to 1,000 tubes per hour.

So far as we are aware none of the supply houses is furnishing the complete apparatus at the present time. The chuck we are using can be made in a few minutes from a piece of brass rod of suitable size for attachment to the motor shaft and turned down to a diameter of about ¼ inch. A hole drilled in the end of the rod receives the brush wire, which is held in place by means of a screw. The entire apparatus costs only a few dollars.

I. M. LEWIS
UNIVERSITY OF TEXAS

SPECIAL ARTICLES

NOTES ON A SPECIES CROSS IN MICE AND ON AN HYPOTHESIS CONCERNING THE QUANTITATIVE POTENTIALITY OF GENES

SPECIES crosses in laboratory rodents are not very numerous. That of *Cavia rufescens* Lund. and *C. porcellus* Linn. reported by Detlefsen,[1] and of *Rattus rattus* × *R. alexandrinus* studied by de L'Isle ('65),[2] and of Morgan,[3] are among the more important.

The present note deals with a cross between males of *Mus wagneri* (Eversman) from China[4] and tame *Mus musculus* females of a dilute brown race which has been inbred brother to sister in my laboratory since 1909.

Mus wagneri is small, nervously active, with relatively long ears and short tail, and is white-bellied, black agouti in color. This color variety was first described genetically by Cuénot[5] as a "gris à ventre blanc." It is allelomorphic and epistatic to ordinary grey-bellied black agouti.

The hybrids were easily obtained, grew vigorously, and were intermediate in size between the two parent species. In color they were white-bellied black agouti, but with deeper pigmentation than that of *M. wagneri*. In many of them the proportion of black hairs on the dorsal surface was very high, suggesting a weakened condition of the agouti pattern. The same tendency was seen in the ventral surface where dark-tipped hairs frequently were found in areas which in contrast to the white-tipped hairs gave a pattern which we have described as a "vest." It is extremely interesting to note this condition, which will again be referred to.

The three recessive genes of the dilute brown *M. musculus* females—a. (non agouti), b. (brown) and d. (dilution) disappeared in F_1 just as they would have done had the white-bellied black agouti pattern of *M. wagneri* been that of the same color variety of *M. musculus*.

A back cross of F_1 males and dilute brown females showed segregation of the three genes. The eight classes listed below were expected in equal numbers. The actual figures, however, depart widely from equality as follows:

[1] *Publ. Carnegie Inst. of Wash.* (1914) No. 205.

[2] *Arch. f. Rassen u. Gesellschafts Biologie* (1911) 8; 697.

[3] *Am. Nat.* (1907) 43; 182–

[4] I am greatly indebted to Dr. Sheo Nan Cheer, who personally brought with him from China the live specimens of *M. wagneri* which form my breeding stock of that species.

[5] *Arch. Zool. Exp. et Gén.* (1911) 8, 40–56.

	Black agouti white belly	Black	Dilute black agouti white belly	Brown agouti white belly	Dilute black	Dilute brown agouti white belly	Brown	Dilute brown	Total
Observed	31	30	10	19	23	21	16	13	163
Expected	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	163.2

If the pairs of genes are considered separately, we find that there are 94 animals with gene B(black) and 69 without it. There are 96 with gene D(intensity) and 67 with d(dilution), while there are 81 with A^w (agouti white belly) and 82 with a (non-agouti). Obviously the chief excess is found in black or intense animals. When these two genes are found together it appears that there are 61 animals, while those with (b) and (d) number 34. Those with (B) and (d), 33, and those with (b) and (D), 35. A somewhat similar excess of animals which had both (B) and (D) was observed in a cross reported by the writer and Phillips,[6] between color varieties within the species *M. musculus*. It is probable that it depends upon death of recessive color combinations rather than upon any linkage or other gametic disproportion.

The "vested" variety is an extremely interesting phenomenon. What perhaps is a somewhat similar condition in that it involves a "weakening" of the agouti pattern was observed by Detlefsen in the case of the guinea pig hybrids referred to above. In his material almost complete disappearance of "ticked" hairs was observed on the dorsal surface in some hybrids. The same phenomenon has been observed in the mice.

Morgan reports a weakened condition of the black factor in F_1 generation mice produced in a cross between a small Japanese-waltzing male and a larger brown non-waltzing female. It is interesting to note that Japanese-waltzing mice are, by many, believed to be descended from *M. wagneri* (see Gates[7]).

At all events we have in three crosses, two of which *do*, and one of which *may* involve specific differences, distinct evidence of "weakened" activity of three epistatic genes introduced by males of the smaller species or variety.

This suggests an interesting line of reasoning as follows:

In addition to the qualitative attributes which distinguish it, each gene may have a quantitative potentiality adapted by natural selection to the size of the body which its activity must cover.

Since activity of genes in development is undoubtedly related in some way to liberation of energy, and since liberation of energy means previous storing of energy, it seems likely that a species will by natural selection eliminate those individuals wasteful enough to build more of such potential activity than is commonly called upon. This would follow since surplus material would require additional food and storage space and would tax more than was necessary the systems by which waste products of metabolism were eliminated.

When a species cross is made resulting in an F_1 hybrid of distinctly larger size than that of the small parent species, the genes of the latter adapted in their physiological activity to covering only a certain more or less limited body area, may find themselves unable to act over the whole of the body of the larger hybrid, and as a result the recessive gene would partially express itself. Such was actually the case in the three crosses referred to. The rôle of the cytoplasm in determining the degree or extent to which the gene may act is also possibly a matter of great importance in this connection. Data on reciprocal crosses in the three cases in question are not as yet available.

The principle of the quantitative limits of gene activity will, if established, be an interesting line of research to follow in size inheritance and in many other genetic problems of birds and mammals.

C. C. LITTLE

LABORATORY OF MAMMAL GENETICS,
ANN ARBOR, MICH.

[6] *Am. Nat.* (1913) 47, 760–765.

[7] *Publ. Carnegie Inst. of Wash.* (1926) No. 337.

THE ABSORPTION SPECTRUM OF MERCURY AT HIGH PRESSURE ADMIXED WITH NITROGEN[1]

A CONSPICUOUS feature of the absorption spectrum of mercury, as shown by Mohler and Moore,[2] is the appearance of a train of eighteen flutings reaching their optimum range of 2770–2930 A at 420° C. (2100 mm.).

In the present work, when 13 mm. of pure nitrogen gas was admitted to the same 40 cm. quartz absorption tube before sealing off and spectra photographed using the same source of radiation (a high potential discharge in hydrogen), this system of flutings was extended on the red to 3087 A at temperatures of 215–305° (28–215 mm. Hg) and on the violet to

[1] Publication approved by the Director of the U. S. Bureau of Standards, Department of Commerce.

[2] Mohler and Moore, *J. Optical Soc. Am.* 15, p. 74 (1927).